Adaptec ATA RAID 1200A

Installation and User's Guide

adaptec®

Regulatory Compliance Statements

Federal Communications Commission Radio Frequency Interference Statement

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. However, if this equipment does cause interference to radio or television equipment reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.
- Use a shielded and properly grounded I/O cable and power cable to ensure compliance of this unit to the specified limits of the rules.

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

Adaptec, Inc. ATA RAID 1200A

Tested to Comply
With FCC Standards

FOR HOME OR OFFICE USE

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- EN55022 (1998) Emissions
- EN55024 (1998) Immunity:
  - EN61000-4-2 (1998) Electrostatic discharge: ±4 kV contact, ±8 kV air
  - EN61000-4-3 (1998) Radiated immunity
  - EN61000-4-4 (1995) Electrical fast transients/burst: ±1 kV AC, ±0.5 kV I/O
  - EN61000-4-5 (1995) Surges ±1 kV differential mode, ±2 kV common mode
  - EN61000-4-6 (1996) Conducted immunity: 3 V
  - EN61000-4-11 (1994) Supply dips and variation: 30% and 100%

In addition, all equipment requiring U.L. listing has been found to comply with EMC Directive 73/23/EEC as amended by 93/68/EEC in accordance with EN60950 with amendments A1, A2, A3, A4, A11.

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- The TSID number is included on two white, bar-coded labels, like the example below.

- If you register by mail, affix one copy of the TSID label to the registration card, which may be contained on the CD. Also affix a copy of the TSID label to the CD jacket so that you don't lose it.

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Overview

The Adaptec ATA RAID 1200A card provides data protection and increased performance with enhanced ATA technology. The Adaptec ATA RAID 1200A supports ATA/100 hard drives with data transfer rates up to 100 MB/sec providing maximum disk performance in systems that have a PCI (Peripheral Component Interconnect) bus.

Features

The Adaptec ATA RAID 1200A is a low profile small form factor card that provides two channels with 256 bytes of FIFO per channel. Each channel uses an internal ATA connector that supports two ATA hard drives in a master/slave configuration. The controller supports up to four ATA hard drives in RAID 0, RAID 1, and RAID 0/1, and JBOD modes.

The Adaptec ATA RAID 1200A utilizes Plug-and-Play technology and installs into a standard PCI slot and supports a 32-bit and 33 MHz PCI bus.

Note: The Adaptec ATA RAID 1200A supports ATA hard disk drives only and is backward compatible with all ATA/66 systems. ATA/33 hard disk drives are not supported. Throughout the industry these devices are also referred to as ATA, EIDE, IDE, or UltraDMA.

This *Installation and User's Guide* explains how to install the Adaptec ATA RAID 1200A card, connect ATA hard disk drives to it, run the BIOS Array Configuration Utility to create the first array for bootable array configuration, and then install the software device drivers for your operating system.

Use the Adaptec ATA RAID Management Software™, which is included with the Adaptec ATA RAID 1200A, to create and manage arrays, and provide proper levels of fault tolerance and event notification. See Chapter 5 for information on installing and using the software.

Contents of Kit

- Adaptec ATA RAID 1200A card
- Two 40-pin, 80-wire ATA/100 cables
- CD containing Adaptec ATA RAID 1200A device drivers, Adaptec ATA RAID Management Software, online copy of the *Adaptec ATA RAID 1200A Installation and User's Guide*, and Readme file
- Floppy disk containing Windows software device drivers
- Printed copy of the *Adaptec ATA RAID 1200A Installation and User's Guide*

System Requirements

The minimum system requirements for the Adaptec ATA RAID 1200A are:

- A Pentium II, 266 MHz Processor or higher system that is PCI 2.2 or previous version compliant
- An available, unobstructed 5V PCI slot that supports Bus Mastering
- A minimum of one ATA drive
- CD-ROM or DVD-ROM drive
- Floppy disk drive
- 64 MB or more of system memory
- 5 MB of free hard disk space for the Adaptec ATA RAID Management Software

Operating Systems

The Adaptec ATA RAID 1200A supports these operating systems:

- Microsoft Windows® 98 (and Windows 98 Second Edition)
- Microsoft Windows® Millenium Edition (Me)
- Microsoft Windows® 2000 Professional and Server
- Microsoft Windows NT® 4.0
- Microsoft Windows XP®

ATA/100 Compatibility Requirements

The ATA / 100 standard is backwards compatible with all ATA / 66 systems. When used with ATA / 66 systems, the Adaptec ATA RAID 1200A card is limited to the transfer speeds of the ATA / 66 system.

Warning: *Do not* install more than one Adaptec ATA RAID 1200A card in your system.

Note: The Adaptec ATA RAID 1200A supports only hard disk drives. *Do not* connect any ATAPI devices (CD-ROM, LS-120, MO, or removable media drives) to the Adaptec ATA RAID 1200A controller.

To achieve the ATA / 100 transfer speeds, you must ensure that:

- The drives are ATA / 100 hard drives.
- The cable must be 80-conductor, ATA / 100 cables and the length should not exceed 18 inches (45 cm). ATA / 100 cables are supplied with the Adaptec ATA RAID 1200A controller kit.
- The operating system is one of the following and supports Direct Memory Access (DMA): Windows 98, Windows Me, Microsoft Windows 2000, Windows NT, and Windows XP.

Bootable Controller

If you are using the Adaptec ATA RAID 1200A card with a SCSI card in the system and want to make the Adaptec ATA RAID 1200A card bootable, confirm in the system CMOS that this option is available. Refer to your system's documentation for more information.

Installation Overview

To Install the Adaptec ATA RAID 1200A hardware and software, follow these steps:

1 Install the Adaptec ATA RAID 1200A card in your system (see Chapter 2).

2 Connect ATA drives to the Adaptec ATA RAID 1200A card (see Chapter 2).

3 Create the first bootable array using the BIOS Array Configuration Utility (see Chapter 3).

4 Install the appropriate software driver for your operating system (see Chapter 4).

5 Install the Adaptec ATA RAID Management Software on your system (see Chapter 5).

Defining RAID

RAID (Redundant Array of Independent Disks) offers outstanding data availability, excellent performance, and high capacity. A RAID is defined as:

- **Unified array**—Two or more hard drives are grouped to appear as one single device to the host system while operating independently of one another.
- **Fault-tolerant redundancy**—If one drive fails no data is lost. (RAID 0 is an exception to this definition because RAID 0 is not fault tolerant. See *Supported RAID Levels*.)

Supported RAID Levels

The Adaptec ATA RAID 1200A card includes a BIOS Array Configuration Utility for boosting disk performance and data protection. The BIOS Array Configuration Utility supports the following RAID levels:

- **RAID 0, Striping**—Two or more drives that can read and write data in parallel. Offers higher performance than a single drive, but no fault tolerance. RAID 0 arrays do not store redundant data; if any disk in the array fails, all data is lost.

- **RAID 1, Mirroring**—Data is mirrored on one pair of disks providing 100 percent redundancy. Offers complete fault tolerance. If one disk fails, data is still available. Increases read performance through striping, but write performance is unaffected. Adaptec recommends using the same size disks, but if you use a disk with less disk space, the actual data capacity of the array equals the smaller capacity disk.
- **RAID 0/1, Mirrored Striping**—Increases both read and write performance. Data is striped and mirrored on two or more pairs of disks. Offers complete fault tolerance. If one disk in a pair fails, data is still available. The actual data capacity of the array equals the available disk space of the smaller RAID 0 array.
- **JBOD, Volume**—Subsystem of disk drives. Allows you to combine disk drives into larger logical volumes. Two or more hard disk drives of unequal size can be grouped to appear as one single device to the host system. Doesn't provide fault tolerance. Adaptec recommends using the same size disks, but if you use a disk with less disk space, you can combine the disks into a single unit without loss of any capacity.

RAID Performance Hints

The following suggestions provide the best performance and reliability:

- Use ATA 66/100 hard disks.
- Use the same model hard disk drive throughout the system. Different models exhibit different timing characteristics, which might decrease overall RAID performance.
- If you have only two hard disk drives, connect each on a different channel as a master drive.
- If you are using mirrored pairs, group each pair on a separate connector.
- Always use 80-conductor cables.

2

Installing the Hardware

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This chapter explains how to install the Adaptec ATA RAID 1200A card and connect ATA hard drives to it.

Warning: Before handling the Adaptec ATA RAID 1200A card and any other electronic component, ground yourself by touching an unpainted metal surface on your computer chassis.

Adaptec ATA RAID 1200A Card Layout

Figure 2-1 identifies the major components on the Adaptec ATA RAID 1200A card. You might find it helpful to refer to this figure while installing the Adaptec ATA RAID 1200A and attaching ATA disk drives to it.

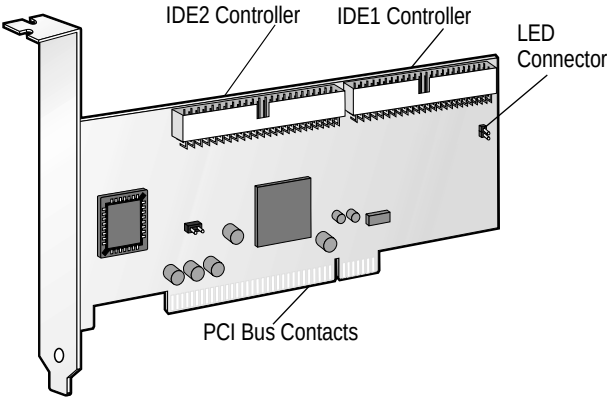

Figure 2-1 Adaptec ATA RAID 1200A Card

Installing the Adaptec ATA RAID 1200A Card

To install your Adaptec ATA RAID 1200A card, follow these steps:

Note: If you are installing the Adaptec ATA RAID 1200A card into an existing system, back up all data before continuing this installation.

1. Turn OFF power to the computer and disconnect the power cord.
2. Remove the cover from the computer case.
3. Locate an unused, unobstructed, PCI expansion slot and remove the expansion slot cover. (The expansion slot must be 5V, PCI 2.2 or previous version compliant, and must support PCI Bus Mastering.) Save the slot cover screw for use in Step 4.

4 Insert the Adaptec ATA RAID 1200A card in the PCI expansion slot; press down firmly until it clicks into place, then replace the slot cover screw as shown in Figure 2-2.

Note: f you are using this Adaptec ATA RAID 1200A card with a SCSI controller in the same system and you want to make the ATA card bootable, install it at the lowest BIOS address. Check your system documentation to determine which slot is at the lowest address. (Usually it is PCI slot 1 at the top for motherboards without AGP slot, and PCI slot 2, second next to the AGP slot, for motherboards with AGP slot.

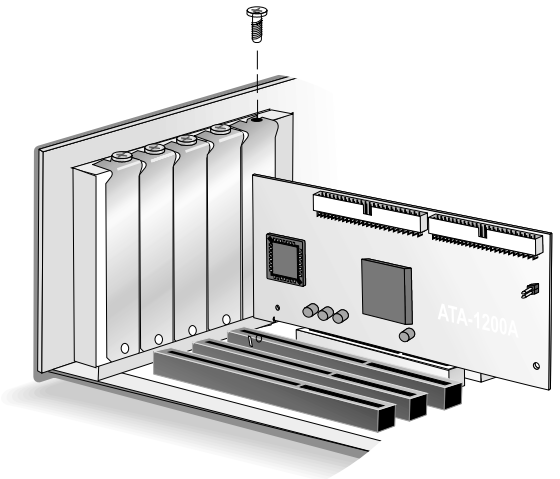

Figure 2-2 Installing the Adaptec ATA RAID 1200A in a PCI Expansion Slot

Connecting the LED Activity Indicator (Optional)

An LED on the front panel of most computers lights to indicate activity on your hard disks. If you want the LED to light whenever there is activity on hard disks connected to the Adaptec ATA RAID 1200A card, you must disconnect the LED cable from the motherboard and connect it to the LED connector on the Adaptec ATA RAID 1200A as shown in Figure 2-3.

Note: If you connect the LED cable to the Adaptec ATA RAID 1200A card,the LED lights whenever there is activity on hard disks connected to the Adaptec ATA RAID 1200A card only. The LED will no longer light whenever there is activity on hard disks not connected to the Adaptec ATA RAID 1200A card.

Note: When connecting the LED cable to the Adaptec ATA RAID 1200A card, make sure you connect the red (or colored) part of the cable to the top portion of the LED connection (plus), and the black part of the cable to the bottom portion (minus).

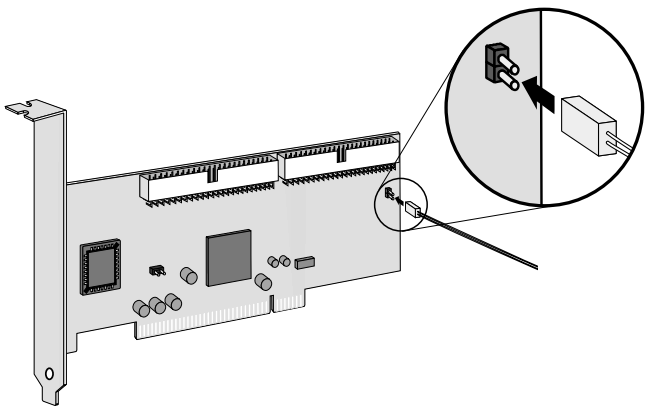

Figure 2-3 Connecting the LED Activity Indicator

Setting up ATA Hard Disk Drives

Setting up ATA drives before connecting them to the Adaptec ATA RAID 1200A card typically involves setting jumpers, mounting ATA drives inside your computer, and connecting power cables to each device.

Since setup can vary from device to device or computer to computer, always refer to the ATA drive's or computer's documentation for specific instructions. Following are some guidelines for setting up ATA drives. Additional installation hints for ATA drives are also provided.

Note: If you refer to the ATA drive's documentation for installation instructions, be sure to return to this document to continue with installation of the software included in your kit.

Setting Jumpers on ATA Disk Drives

If you are installing two hard disk drives, set up each drive as a *master*. This is typically done by changing jumper settings on the drive. The *master* setting is the factory default setting on most ATA drives. Refer to your hard disk drive documentation to determine the correct jumper setting for *master* operation.

If you are installing four hard disk drives, set up two drives as *master* and the other two as *slave*. Mark the *master* and *slave* drives so you remember which are which when you are connecting the cables.

Mounting ATA Drives and Connecting Power Cables

Each ATA drive must be mounted in an available drive bay inside your computer (as shown in Figure 2-4) and connected to a power cable from your computer's power supply. Refer to your computer and device documentation for instructions on installing devices inside your computer.

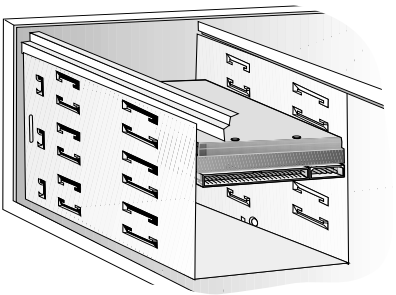

Figure 2-4 ATA Drive Mounted in Drive Bay

Connecting Your Hard Disk Drives

The Adaptec ATA RAID 1200A supports up to four ATA drives in a *master*/*slave* configuration. Before connecting drives to the Adaptec ATA RAID 1200A, be sure to also review *Setting up ATA Hard Disk Drives* on page 2-5.

Connecting ATA Disk Drives to the Adaptec ATA RAID 1200A Card

Connect all hard disk drives to the Adaptec ATA RAID 1200A card using the 40-pin ATA / 100 cables included in your kit. The ATA / 100 cables have the following color-coded connectors:

- **Blue**—Connects to the controller
- **Black**—Connects to the master or single drive
- **Gray**—Connects to the slave or second drive.

Note: Although the master / slave configuration is determined by the jumper settings on your hard disk drives, Adaptec recommends you use this color-coded configuration for the cable. See *Setting Jumpers on ATA Disk Drives* on page 2-5 for more information.

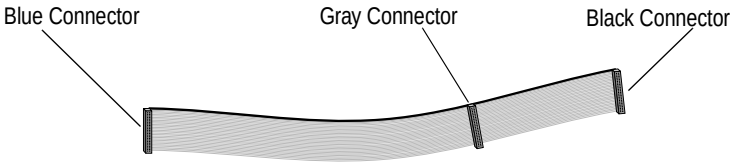

Figure 2-5 40-pin ATA/100 Cable

To connect ATA drives to the Adaptec ATA RAID 1200A card, follow these steps:

1 Connect the *blue* connector of an ATA / 100 cable to the channel 1 connector on the controller card as shown in Figure 2-6, being careful to match pin 1 of the cable to pin 1 of the connector. The cables and connectors are keyed. If the cable does not slide easily into the connector, *do not* force it. Instead, reverse the cable.

Note: The stripe along the edge of the cable indicates Pin #1. If the cable does not slide easily into the connector, reverse the cable.

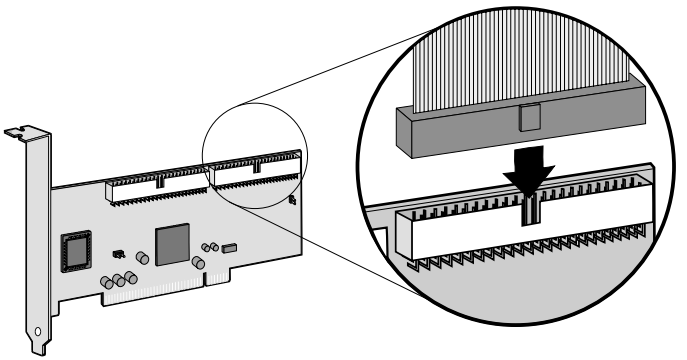

Figure 2-6 Connecting the Cable to the Channel Connector

2 Connect the *black* connector of the ATA / 100 cable to a master drive. If you have not already set up your drives, refer to *Setting up ATA Hard Disk Drives* on page 2-5 before continuing.

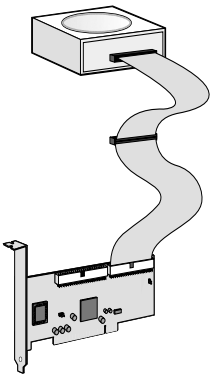

Figure 2-7 Connecting an ATA Drive

3 If you are connecting only two hard disk drives, connect the *blue* connector of the second ATA / 100 cable to the channel 2 connector on the controller card, just as you did in Step 1. Now that you have finished connecting both drives, your hardware installation is complete; *do not* continue to the next step.

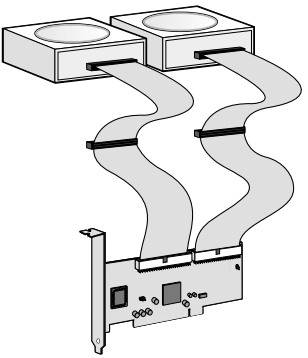

Figure 2-8 Connecting Two ATA Drives

4 If you are connecting four hard disk drives, connect the *gray* connector of the ATA / 100 cable to the *slave* drive and go to Step 5.

5 Connect the *blue* connector of the second ATA / 100 cable to the channel 2 connector on the controller card, just as you did in Step 1.

6 Connect the *black* connector of the ATA / 100 cable to the remaining *master* drive.

7 Connect the *gray* connector of the ATA / 100 cable to the remaining *slave* drive.

Note: Use the ATA / 100 cables supplied with your Adaptec ATA RAID 1200A controller kit for optimum performance.

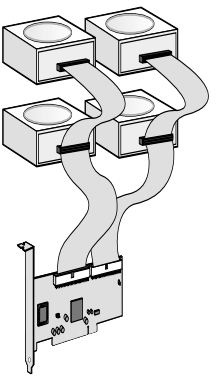

Figure 2-9 Connecting Four ATA Drives

Set Mainboard CMOS Setup

The Adaptec ATA RAID 1200A card is a PCI Plug and Play device. Therefore, you should not have to make any changes to the system CMOS. The system should automatically assign the Interrupt and Port address. To set the Adaptec ATA RAID 1200A card to be the bootable controller, confirm in the system CMOS that the drive types for on-board IDE controller drives are set to **Not Installed** or **None**. Alternatively, you can use the Boot to SCSI option if this setting is available.

3

Using the BIOS Array Configuration Utility

In this Chapter

Introduction	3-1
Create Array	3-2
Delete Array	3-6
Create/Delete Spare	3-6
Select Boot Disk	3-7

Introduction

The Adaptec ATA RAID 1200A card has an on-board BIOS Array Configuration Utility which allows you to create a bootable array on your hard disk drives.

Before you can use your BIOS Array Configuration Utility, make sure you have done the following:

1. Installed the Adaptec ATA RAID 1200A card into a valid PCI slot.
2. Attached the hard disk drives.
3. Reinstalled the computer cover and connected all power cables.
4. Powered-on your system.

To start the BIOS Array Configuration Utility, press **Ctrl+H** while starting up the system to enter the BIOS Configuration Main menu. The Main menu of the BIOS Array Configuration Utility appears as shown in Figure 3-1.

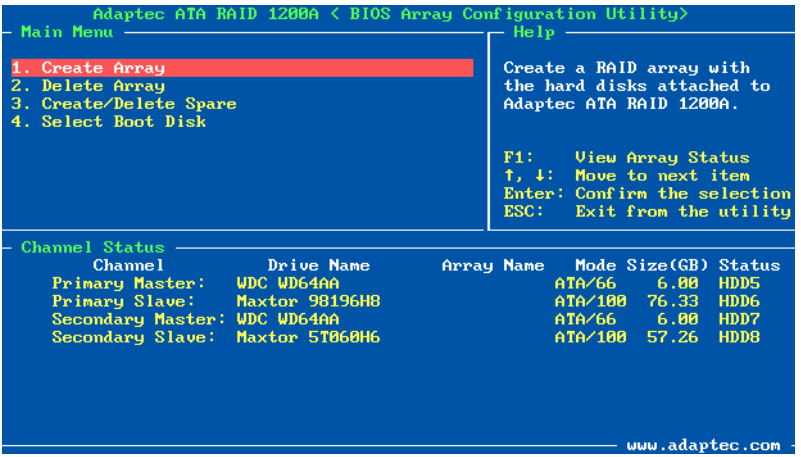

Figure 3-1 BIOS Array Configuration Utility Main Menu

To use the menu

- Press **F1** to view array status.
- Press the arrow keys to navigate between options.
- Press **Enter** to confirm any selection.
- Press **Esc** to return to the Main menu.

Create Array

This option allows you to create RAID arrays with the hard disk drives attached to your Adaptec ATA RAID 1200A card.

After you have selected the Create Array option in the Main menu, press **Enter** to display the Create RAID menu as shown in Figure 3-2.

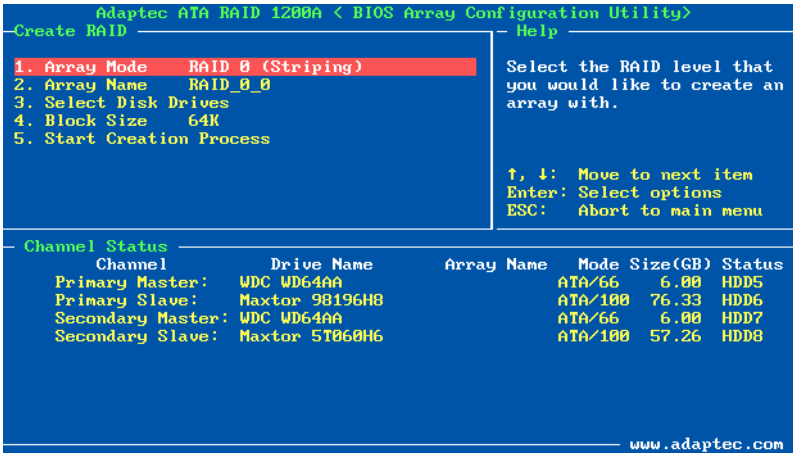

Figure 3-2 Create RAID Menu

Caution: If you proceed to create RAID, all the data stored in the hard disks will be lost. The exception is RAID 1 Duplication where data is copied from the Source disk to the Target disk.

Array Mode

This option allows you to select the appropriate RAID mode for the desired array. There are four modes to choose from (see Figure 3-3):

- **RAID 0 (Striping)** —This option is recommended for high performance usage. Requires at least two disks.
- **RAID 1 (Mirroring)**—This option is recommended for data security usage. Requires two disks.
- **RAID 0/1 (Mirrored Striping)**—This option is recommended for data security and high performance usage. Allows Mirroring with two Striping Arrays. Requires four disks.

- **JBOD (Volume)**—This option is recommended for high capacity without redundancy or added performance features. Requires at least two drives.

For more information about RAID levels, see *Supported RAID Levels* on page 1-5.

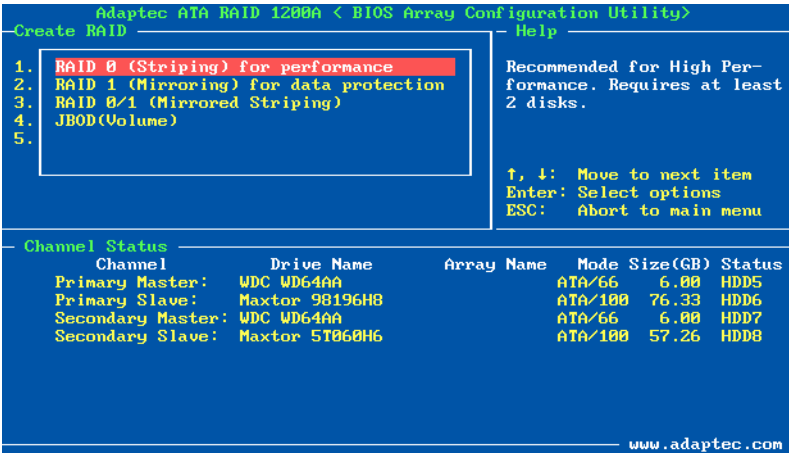

Figure 3-3 RAID Array Modes

Array Name

This option allows you to specify an array name of eight characters or less. If you don't want to specify an array name, press **Enter** and one will be automatically created.

Select Disk Drives

This option allows you to select the disk drives to be used with the RAID array.

Block Size

This option allows you to select the block size of the RAID array. There are three options: 16K, 32K, and 64K. The default block size for RAID 0 is 64K. This option is available for selection for RAID 0 and RAID 0/1 only.

Start Creation Process

After you have made your selections, select this option and press **Enter** to start the creation process.

Note: If you skip the Select Disk Drive option before selecting the Start Creation process, you will get an error message at the end of the creation process.

Start Creation With RAID 1

When you select the Start Creation option under RAID 1, you will get a Process option sub-menu displaying the following options (see Figure 3-4):

- Create only
- Create and duplicate

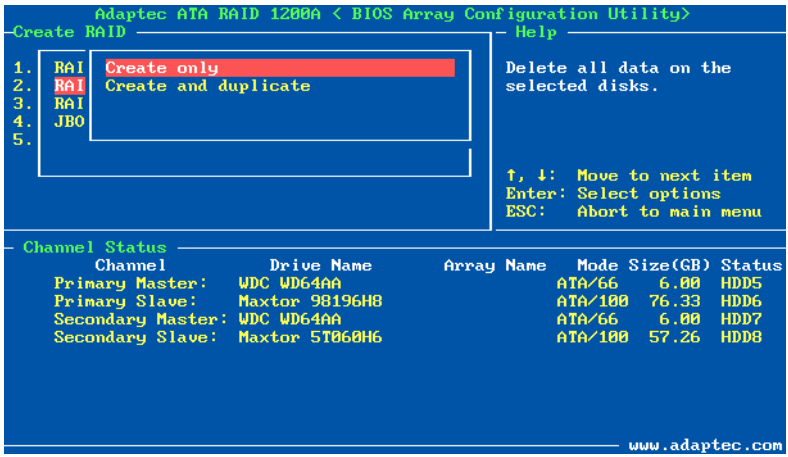

Figure 3-4 RAID 1 Options

Create only

This option allows you to create the array. When you select this option, you will get a warning that all the data on the selected disks will be deleted. Press **Y** to continue.

Create and duplicate

This option allows you to duplicate all the data on the Source disk drive (disk #1) to the Target disk drive (disk #2).

Note: The size of the Source disk drive must be less than or equal to the size of the Target disk drive.

Depending on the size of your disk drive, the BIOS setting can take several hours to run the duplication. Wait, or press **Esc** to cancel.

Delete Array

This option allows you to remove a RAID array on your Adaptec ATA RAID 1200A card.

Note: After you have made and confirmed this selection, all the data stored in the hard disk drive will be lost. (The entire partition configuration will be deleted also.)

Create/Delete Spare

This *hot spare* function allows you to select the disk to be used as a spare for a Mirror Disk array or to delete a spare disk from a Mirror Disk array. If one of your disks in an array fails, you have the option to quickly rebuild the array using the spare disk.

Note: You must create a RAID 1 array before you can create a spare disk.

Note: The size of the spare disk drive must be equal to or larger than the size of the Source disk drive.

Select Boot Disk

This option allows you to select the boot disk from among the hard disk devices attached to the Adaptec ATA RAID 1200A card.

Warning: If you create an array with your boot disk, you must remove the boot mark before you can delete the RAID array.

Using the arrow keys, from the Main menu select **Select Boot Disk** and press **Enter**. In Channel Status, select the drive you would like to set as the bootable disk and press **Enter**. There will be an asterisk in parentheses indicating that the disk drive selection has been made. Reselection will erase the boot mark.

Note: Your PC or server must be configured properly to use the Adaptec ATA RAID 1200A card as the bootable controller. The system will then use the bootable array as the (fixed) boot C drive.

4

Installing the Device Driver

In this Chapter

Installing the Device Driver for Windows 98 4-2
Installing the Device Driver for Windows Me 4-4
Installing the Device Driver for Windows 2000 4-5
Installing the Device Driver for Windows NT 4.0 4-7
Installing the Device Driver for Windows XP 4-9

This chapter explains how to install the device driver for the following Windows operating systems:

- Windows 98 (and Windows 98 Second Edition)
- Windows Me
- Windows 2000
- Windows NT 4.0
- Windows XP

Installing the Device Driver for Windows 98

Installing the Driver When Installing Windows 98

Before you begin to install Windows 98, you will need the driver floppy disk supplied with your Adaptec ATA RAID 1200A controller kit.

When installing Windows 98 on a hard disk drive or an array attached to the Adaptec ATA RAID 1200A, connect only the hard disk drive or array that you intend to use as the Windows 98 boot drive.

To install the driver when installing Windows 98, follow these steps:

1. Install Windows 98 completely on drives or arrays attached to the Adaptec ATA RAID 1200A before installing the driver.
2. Select **Start** from the task bar, then select **Settings** and **Control Panel**.
3. Double-click the **System** icon, then select the **Device Manager** tab.
4. Select **Other devices**, then **PCI Mass Storage Controller**.
5. Select **Properties**, then select the **General** tab.
6. Select **Reinstall Driver** and follow the Update Device Driver Wizard.
7. On the Wizard searches for update drivers for PCI Mass Storage Controller window, click **Next**.
8. Select **Search for a better driver than the one your device is using now** and click **Next**.
9. On the Windows will now search for new drivers screen, make sure a checkmark only appears next to specify location. Insert the Adaptec ATA RAID 1200A floppy disk into the floppy disk drive and type the following path as the location, then click **Next**.

   ```
   a:\win98_me
   ```

10 You will get this message:

Windows is now ready to install the best driver for this device...

Click **Next**.

11 After completing the installation, select **Finish**.

12 You will be prompted to restart the computer. Select **Yes**.

Installing the Driver When Windows 98 is Already Installed

To install the Adaptec ATA RAID 1200A driver if Windows 98 is already installed, follow these steps:

1 Start Windows 98.

Windows 98 will automatically discover the new hardware and start the Found New Hardware Wizard to guide you through the device driver installation.

2 On the Add New Hardware Wizard window, select **Next**.

3 Select **Search for the best driver for your device** and click **Next**.

4 On the Windows will now search for new drivers screen, make sure only a checkmark appears next to Specify Location. Insert the Adaptec ATA RAID 1200A floppy disk into the floppy disk drive. Type the following path as the location, then click **Next**:

```
a:\win98_me
```

5 The following message appears:

Windows is now ready to install the best driver for this device...

Click **Next**.

6 After completing the installation, select **Finish**.

7 The Adaptec RCM device is detected and the driver is automatically loaded. Installation is now complete.

Installing the Device Driver for Windows Me

Installing the Driver When Installing Windows Me

Before you begin to install Windows Me, you will need the driver floppy disk supplied with your Adaptec ATA RAID 1200A controller kit.

When installing Windows Me on a hard disk drive or an array attached to the Adaptec ATA RAID 1200A, connect only the hard disk drive or array that you intend to use as the Windows Me boot drive.

To install the driver when installing Windows Me, follow these steps:

1. Install Windows Me completely on drives or arrays attached to the Adaptec ATA RAID 1200A before installing the driver.
2. Select **Start** from the task bar, then select **Settings** and **Control Panel**.
3. Double-click the **System** icon, then select the **Device Manager** tab. If the System icon is not present, click the link on the left side of the window that says View all Control Panel options.
4. Select **Other devices**, then **PCI Mass Storage Controller**.
5. Select **Properties**, then select the **General** tab.
6. Select **Reinstall Driver** and follow the Update Device Driver Wizard.
7. On the Wizard searches for update drivers window, select **Automatic search for a better driver**. Insert the Adaptec ATA RAID 1200A floppy disk into the floppy disk drive and click **Next**.
8. The following message appears:

   Windows has finished installing an updated driver for your hardware device.

   Click **Finish**.
9. You will be prompted to restart the computer. Select **Yes**.

Installing the Driver When Windows Me is Already Installed

To install the Adaptec ATA RAID 1200A driver if Windows Me is already installed, follow these steps:

1 Start Windows Me.

Windows Me will automatically discover the new hardware and start the Found New Hardware Wizard to guide you through the device driver installation.

2 On the Add a New Hardware Wizard window, insert the Adaptec ATA RAID 1200A floppy disk into the floppy disk drive. Select **Automatic search for a better driver** and click **Next**.

3 The following message appears:

Windows has finished installing the new hardware device.

Click **Finish**.

4 The Adaptec RCM device is detected and the driver is automatically loaded. Installation is now complete.

Installing the Device Driver for Windows 2000

Installing the Driver When Installing Windows 2000

To install the driver when installing Windows 2000, follow these steps:

1 Insert the Windows 2000 setup media (floppy disk or CD) and restart your system to begin the Windows 2000 installation. You might see the following message:

Press any key to boot from CD.

You will have five seconds to press a key to boot from the CD.

2 When the following message is displayed, press **F6** :

Press F6 if you need to install a third party SCSI or RAID driver...

3 A message will appear after a short time, prompting you to install your driver. Press **S** to specify a driver.

4 Insert the Adaptec ATA RAID 1200A driver floppy disk into the floppy disk drive and press **Enter**.

5 You will be presented with a selection of driver options. Using the arrow keys, select the following driver and press **Enter**:

Adaptec ATA RAID 1200A Controller for Win2000

If you have no other controllers to add, press **Enter** to continue with the Windows 2000 installation.

Installing the Driver When Windows 2000 is Already Installed

To install the Adaptec ATA RAID 1200A driver if Windows 2000 is already installed, follow these steps:

1 Start Windows 2000.

Windows 2000 will automatically discover the new hardware and start the Found New Hardware Wizard to guide you through the device driver installation.

2 At the Welcome to the Found New Hardware Wizard window, select **Next**.

3 On the Install Hardware Device Drivers screen, select **search for a suitable driver for my device** and click **Next**.

4 On the Locate File screen, select **Floppy Disk Drives** and insert the Adaptec ATA RAID 1200A floppy disk into the floppy disk drive. Click **Next**.

5 On the the wizard found a driver screen, click **Next**.

6 At the Completing the Found New Hardware Wizard window, select **Finish**.

7 The Adaptec RCM device is detected and the driver is automatically loaded. Installation is now complete.

Installing the Device Driver for Windows NT 4.0

Installing the Driver When Installing Windows NT 4.0

Before you begin to install Windows NT 4.0, you will need the driver floppy disk supplied with your Adaptec ATA RAID 1200A controller kit.

To install the driver when installing Windows NT 4.0, follow these steps:

1. Start your system with the Windows NT 4.0 Boot disk in the floppy disk drive or the Windows NT 4.0 Boot CD in the CD-ROM drive.
2. Press the **F6** key when the message Setup is inspecting your computer's hardware configuration is displayed.
3. Follow the on-screen prompts. After a few moments, you will see a blue screen message, To set up Windows now, press Enter. Press **Enter** to begin the installation.
4. Press **S** to specify an additional device.
5. Press **Enter** to select **Other** and insert the floppy disk into your floppy disk drive and press **Enter** again.
6. Using the arrow keys, select the following driver and press **Enter**:

   Adaptec ATA RAID 1200A Controller for Win NT 4.0
7. To add the driver for other devices in your system, press **S** for each additional device and insert the appropriate driver disk. Your system manufacturer and respective device vendor should provide these device drivers.
8. Press **Enter** to continue with the Windows NT operating system setup. Follow the instructions on-screen and in the Windows NT documentation to complete the installation.

Installing the Driver When Windows NT 4.0 is Already Installed

To update or install the Adaptec ATA RAID 1200A driver if Windows NT is already installed, follow these steps:

1. Start Windows NT.
2. Click the **Start** button on the Windows NT task bar, then select **Settings**.
3. From the Settings menu, select **Control Panel**.
4. From the Control Panel, select the **SCSI Adapters** icon.
5. From the SCSI Adapters window, select the **Drivers** tab.
6. From the Drivers window, select **Add**.
7. Select **Have Disk**.
8. Insert the Adaptec ATA RAID 1200A driver disk into your floppy disk drive and press **Enter**. Enter the following path to the installation files, then click **OK**.

   ```
   a:\win_nt
   ```

9. In the Install Driver window, click **OK**.
10. On the SCSI Adapters window, click **OK**. The driver is now installed and started.

Installing the Device Driver for Windows XP

Note: For the most up-to-date Windows XP drivers and installation instructions, see the Readme file or go to the Adaptec Web at www.adaptec.com.

Warning: When installing the device driver for Windows XP, install only the Adaptec device driver. Other manufacturer's device drivers are not compatible with the Adaptec ATA RAID 1200A card.

Installing the Driver When Installing Windows XP

To install the driver when installing Windows XP, follow these steps:

1. Insert the Windows XP setup media (floppy disk or CD) and restart your system to begin the Windows XP installation. You might see the following message:

   Press any key to boot from CD.

   You will have five seconds to press a key to boot from the CD.

2. When the following message appears, press **F6**:

   Press F6 if you need to install a third party SCSI or RAID driver...

3. A message will appear after a short time, prompting you to install your driver. Press **S** to specify a driver.

4. Insert the Adaptec ATA RAID 1200A driver floppy disk into the floppy disk drive and press **Enter**.

5. You will be presented with a selection of driver options. Using the arrow keys, select the following driver and press **S**:

   Adaptec ATA RAID 1200A Controller for Windows XP

   If you have no other controllers to add, press **Enter** to continue with the Windows XP installation.

Installing the Driver When Windows XP is Already Installed

To install the Adaptec ATA RAID 1200A driver if Windows XP is already installed, follow these steps:

1. Start Windows XP.

   Windows XP will automatically discover the new hardware and start the Found New Hardware Wizard to guide you through the device driver installation.

2. Select the option, **Install from a list or specific location (Advanced)**, then select **Next**.

3. Select the option, **Don't search, I will choose the driver to install**, then click **Next**.

4. Click **Have Disk** button.

5. Insert the Adaptec ATA RAID 1200A floppy disk into the floppy disk drive. Type the following path as the location, click **OK**, then **Next**:

   `A:\win_xp`

6. Follow the on-screen prompts to complete the installation.

7. After completing the installation, select **Finish**.

8. You will be prompted to restart the computer. Select **Yes**.

9. The new hardware Adaptec RCM device is also detected. The drivers are automatically loaded for that device and when it completes, the installation of the driver is complete.

5

Using the Adaptec ATA RAID Management Software

In this Chapter

Installing the Adaptec ATA RAID Management Software 5-2

Using the Adaptec ATA RAID Management Software 5-3

With Adaptec ATA RAID Management Software, you can add, delete, or reconfigure RAID arrays on your system. You can use the easy to use on-screen features to manage your RAID configurations and monitor device information and event notifications.

This chapter explains how to use Adaptec ATA RAID Management Software to perform the following operations:

- Install the Adaptec ATA RAID Management Software
- View arrays, ATA devices, and controllers
- Create, delete, rename, and monitor arrays
- Add a spare disk
- View events

Installing the Adaptec ATA RAID Management Software

To install Adaptec ATA RAID Management Software on your Windows Server or Workstation, follow these steps:

1. Start Windows.
2. Insert the Adaptec ATA RAID Management Software CD in your CD-ROM drive.
3. Follow the instructions on-screen to complete the installation (see Figure 5-1).

Figure 5-1 Adaptec ATA RAID Management Software Setup Menu

Using the Adaptec ATA RAID Management Software

After you have installed the Adaptec ATA RAID Management Software, click the **Start** button on the Windows task bar and select the Adaptec ATA RAID Management Software program (see Figure 5-2).

Figure 5-2 Launch Menu

The Adaptec ATA RAID Management Software Main menu appears (see Figure 5-3).

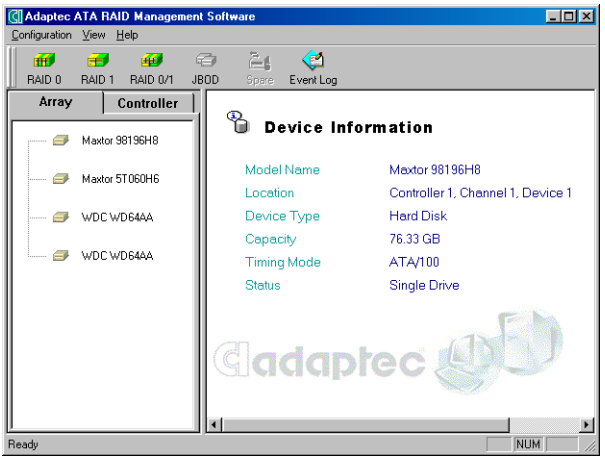

Figure 5-3 Main Menu

Viewing the Array

From the Main menu, select the **Array** tab. The left pane displays the arrays and the hard disk drives. The right pane displays detailed information for the arrays and hard disk drives you have selected.

From the Main menu, you can also select the array and right-click the mouse to open a drop-down menu of options (see Figure 5-4):

- For RAID 0 and JBOD the options are:
  - Delete
  - Rename
- For RAID 1 the options are:
  - Add/Remove Spare
  - Delete
  - Duplicate
  - Rename

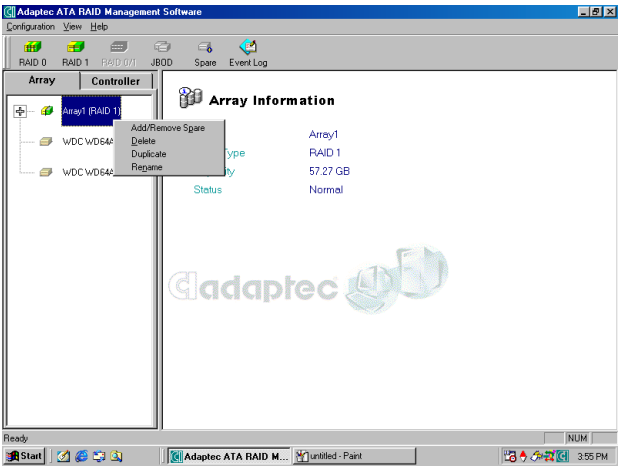

Figure 5-4 RAID 1 Drop-down Menu

- For RAID 0/1 the options are (see Figure 5-5):
  - Delete
  - Build

    This option allows you to verify data integrity and fix miscompares.
  - Rename

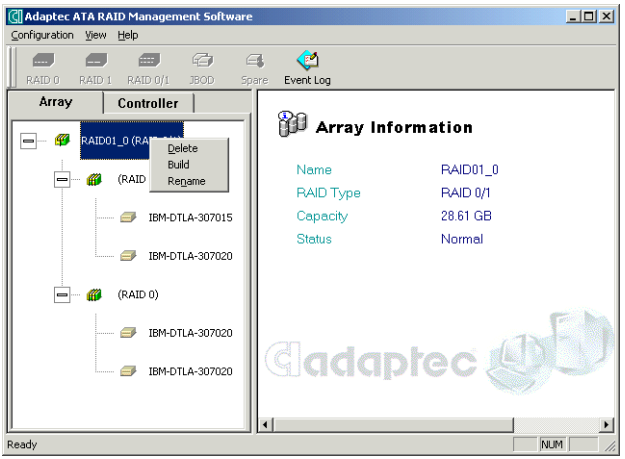

Figure 5-5 RAID 0/1 Drop-down Menu

See the different RAID level sections in this chapter for more information on how to use these options.

Viewing the Controller

From the Main menu, select the **Controller** tab, the left pane displays the host bus adapter (HBA). The right pane displays detailed information for the HBA you have selected (see Figure 5-6).

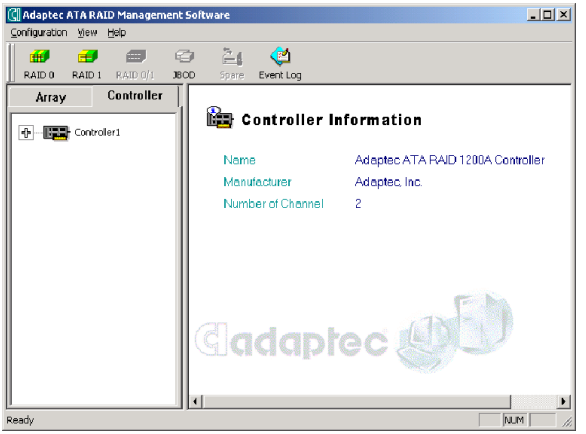

Figure 5-6 Controller Information

Viewing the Channel

From the Controller tab, select your Channel. The right pane displays the Channel Information you have selected (Figure 5-7).

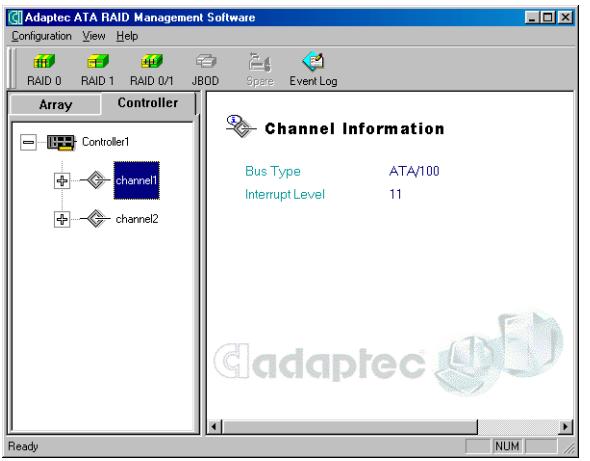

Figure 5-7 Channel Information

Viewing Hard Disk Drives

From the Controller tab, select a Channel, then select a hard disk drive. The right pane displays the Device Information you have selected (see Figure 5-8).

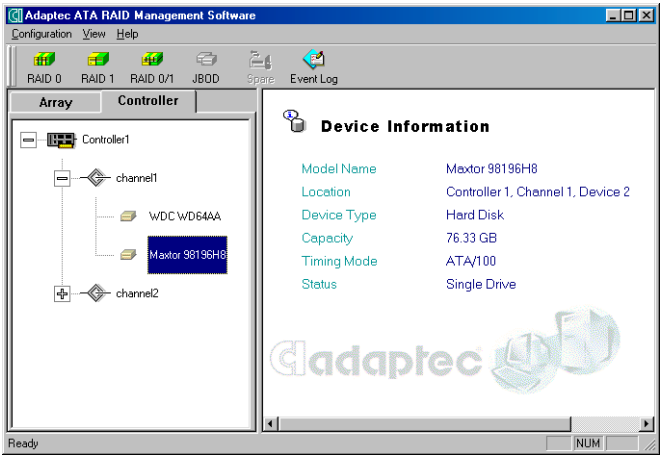

Figure 5-8 Device Information

Create Arrays

To create a RAID array, go to the Main menu and from the toolbar, select a RAID array.

The Adaptec ATA RAID Management Software supports the following RAID levels:

- **RAID 0—**Striping mode for boosting performance.
- **RAID 1—**Mirroring mode for data security.
- **RAID 0/1—**Mirrored Striping.
- **JBOD—**High capacity without redundancy or high-performance features.

For more information on supported RAID levels, see *Defining RAID* on page 1-5.

Create RAID 0 (Striping)

To create a RAID 0 array, follow these steps:

1 From the Main menu Menu bar, select

Configuration>Create>RAID 0 (Striping)

or, from the Main menu toolbar, select **RAID 0**.

2 From the Available Disks screen, select the disk and click **Add**, then click **Next**.

Note: You *must* have at least two hard disk drives to create an array.

3 Select the Block size from the Block Size screen, then click **Next** (see Figure 5-9).

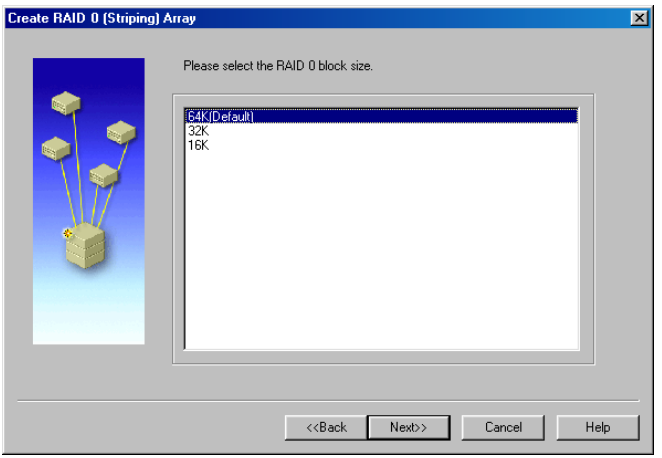

Figure 5-9 Block Size Menu

4 Specify an array name of eight characters or less. If you don't specify an array name, one will be automatically created.

5 Click **Create**. The following message appears:

All data on the selected disks will be deleted! Are you sure you want to continue?

Click **Yes** to continue**.**

6 You will get a confirmation message notifying you that the RAID you specified has been created successfully. You will be prompted to restart your system. Click **Yes** to restart. After you have restarted your system, your Main menu will display your built arrays.

Warning: If you have created an array and tried to use it without first restarting, you can get possible data corruption.

Create RAID 1 (Mirroring)

To create a RAID 1 array, follow these steps:

1 From the Main menu Menu bar, select

Configuration>Create>RAID 1 (Mirroring)

or, from the Main menu toolbar, select **RAID 1**.

2 From the Available Disks screen, select the disk and click **Add** for Source Disk. Select another disk and click **Add** for Target Disk (see Figure 5-10).

Note: You *must* have two hard disk drives to create a RAID 1 array.

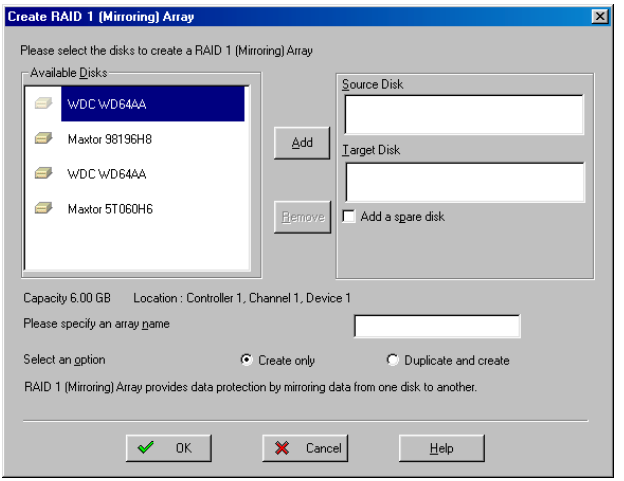

Figure 5-10 Create RAID 1 Menu

3 To add a spare disk, click the **Add a spare disk** option. Select a spare disk from the Available Disks screen and click **Add**.

4 Specify an array name of eight characters or less. If you don't specify an array name, one will be automatically created.

5 Select one of the following options:

- **Create only (default)**—creates RAID 1 relationship between two disks.
- **Create and duplicate**—allows you to duplicate all the data on the Source disk to the Target disk.

6 Click **OK**. A message will be displayed for whichever initialization option you choose:

- **Create only**
  All data on the selected disks will be deleted! Are you sure you want to continue?
- **Create and duplicate**
  All data on the Source disk will be duplicated to the Target disk. Are you sure you want to continue?

Click **Yes** to continue.

7 You will get a confirmation message notifying you that the RAID you specified has been created successfully. You will be prompted to restart your system. Click **Yes** to restart. After you have restarted your system, the Main menu will display your built arrays.

Create RAID 0/1 (Mirrored Striping)

To create a RAID 0/1 array, follow these steps:

1 From the Main menu Menu bar, select

Configuration>Create>RAID 0/1 (Mirrored Striping)

or, from the Main menu toolbar, select **RAID 0/1**.

2 Select the Block size from the Block Size screen. Specify an array name of 8 characters or less. If you don't specify an array name, one will be automatically created. Click **OK**.

3 The following message appears:

All data on the selected disks of the array will be deleted! Are you sure you want to continue?

Click **Yes** to create your array.

Note: You *must* have four hard disk drives to create a RAID 0/1 array.

4 You will be prompted to restart your system. Click **Yes** to restart. After you have restarted your system, the Main menu will display your built array.

Create JBOD (Volume) Array

To create a JBOD array, follow these steps:

1 From the Main menu Menu bar, select

Configuration>Create>JBOD (Volume)

or, from the Main menu toolbar, select **JBOD**.

2 From the Available Disks screen, select the disk, then click **Add**.

Note: You *must* have at least two hard disk drives to create a JBOD array.

3 Specify an array name of eight characters or less. If you don't specify an array name, one will be automatically created. Click **Next**. A list of disks will be displayed.

4 Click **Create**. The following message appears:

All data on the selected disks will be deleted! Are you sure you want to continue?

Click **Yes** to continue.

5 You will get a confirmation message notifying you that the RAID you specified has been created successfully. You will be prompted to restart your system. Click **Yes** to restart. After you have restarted your system, the Main menu will display your built arrays.

View the Event Log

The Event Log is a file used to maintain information about prior controller activities or errors. To view the Event Log, follow these steps:

1 On the Main menu, select **View log** from the toolbar.

You will get a display of the type of event, the time it occurred, and a description of the event.

2 From the toolbar, click **Event Log**. You will get a drop-down menu of options. Select **Sort** to organize your search by type, time, or description (see Figure 5-11).

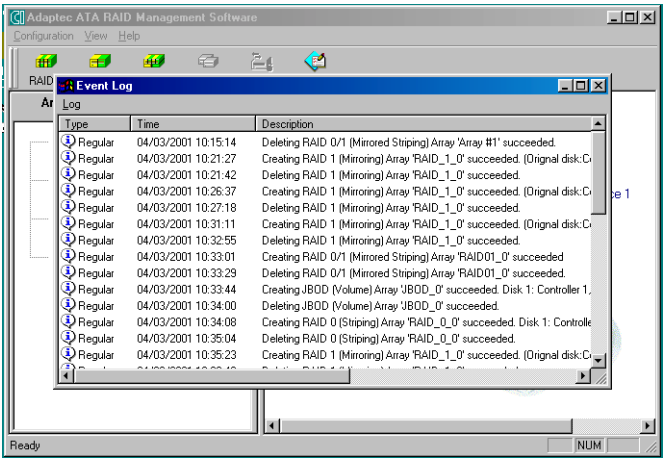

Figure 5-11 Event Log

3 From the toolbar or drop-down menu, click **Exit** to return to Main menu.

Delete Arrays

To delete an array, follow these steps:

1 From the Main menu, select the array and right- click your mouse. A drop-down menu will be displayed. Click **Delete**.

2 The following message appears:

All data on the array will deleted! Are you sure you want to continue?

Click **Yes** to continue.

3 You will get a confirmation message notifying you that the array you specified has been deleted. You will be prompted to restart your system. Click **Yes** to restart.

Warning: To delete a bootable RAID array when an aoperating system is already installed, you *must* do so in the BIOS. See *Select Boot Disk* on page 3-7.

Rename Arrays

To rename an array, follow these steps:

1 From the Main menu, select an array and right-click your mouse. A drop-down menu will be displayed. Click **Rename**.

2 Type a new name for your array. Specify an array name of eight characters or less. Click **OK**. Your new array name will appear on your Main menu screen.

Monitoring Arrays

Rescan

From the Main menu Menu bar (see Figure 5-12), select Adaptec ATA RAID Management Software

Configuration>Monitor>Rescan

With the **Rescan** option, you can view the change status of each device and array.

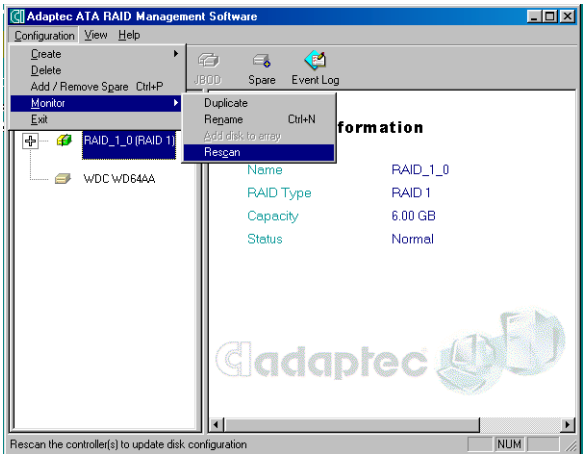

Figure 5-12 Rescan Menu

Duplicate

From the Main menu Menu bar, select

Configuration>Monitor>Duplicate

The **Duplicate** option verifies data integrity and fixes any miscompares.

Add Disk to Array

From the Main menu Menu bar, select

Configuration>Monitor>Add disk to array

This option is available only when a critical RAID 1 or RAID 0/1 array is deleted. It allows you to add a new disk to a critical RAID 1 or RAID 0/1 array.

A

Troubleshooting

In this Appendix

General Troubleshooting Procedures A-1

Frequently Asked Questions A-2

General Troubleshooting Procedures

The following tips are general troubleshooting procedures:

- Check that the Adaptec ATA RAID 1200A card is seated evenly all the way into the PCI slot.
- Check that the PCI expansion slot is 5V and compliant with PCI 2.2 or previous version, and supports Bus Mastering.
- Check that the Adaptec ATA RAID 1200A card is detected during boot. If it is not detected, try to move it to another free PCI slot.
- Check that all ATA cables and power cables are connected.

Frequently Asked Questions

Q: Can I use hard disk drives with different capacity or transfer modes?

A: In order to get optimized performance, Adaptec suggests using hard disk drives with the same model.

Q: Can I use multiple Adaptec ATA RAID 1200A controllers in my system?

A: No, only one Adaptec ATA RAID 1200A controller is supported in each system.

Q: How do I assign a booting device?

A: Press **Ctrl+H** to assign a booting device in the Adaptec RAID Array Configuration BIOS Utility.

Q: Why can't I see correct capacity in FDISK utility?

A: It's a well-known issue of Windows 98's FDISK utility. If an IBM 75 GB hard disk DTLA 307075 only gets 7768 MB in Windows 98's FDISK utility, please contact Microsoft for the latest version of FDISK utility or download IBM's Disk Manager DiskGo! 2.5 to fix it. For Windows 2000, there is no 64 GB issue.

Q: How do I rebuild a mirror array when one of the drives corrupts? (How do I rebuild a RAID 1 array when one of the drives fails?)

A: Restart the system and use the Broken RAID 1 BIOS Menu (BIOS RAID 1 Rebuild Menu) to rebuild the drive by following these steps:

1. Restart the system.
2. The BIOS will detect the change in drive configuration and will bring up the Broken RAID 1 BIOS Menu (BIOS RAID 1 Rebuild Menu) with the following options:

   1. Power OFF and replace the failed drive.

   2. Destroy the mirror 1 relationship. (Eliminate the RAID 1 relationship.)

   3. Select replacement drive and rebuild. (Select a replacement drive and rebuild the array.)

   4. Continue to boot.

3 If you have another drive available for use in rebuilding the RAID 1 array, skip this step and proceed to step 4. If you have no other drive available for rebuild, select option **1** to power OFF the system and replace the problem drive with a functional unit. Power ON your system when you are done.

4 Select option **3** to select the drive you wish to use for the rebuild and proceed to rebuild the RAID 1 array.

Q: Why do I see "NO ROM BASIC SYSTEM HALTED" when booting?

A: There isn't any activated primary partition in you system. Please use FDISK or any other utilities to create / set one.

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PART NUMBER: 512790-06, Ver. AC JG 11/02